

First Lasing at SDL NSLS

Deep Ultra Violet Free Electron Laser has been designed and constructed at Source Development Laboratory (BNL). The scientific goal of the facility is to generate coherent UV radiation at 100 nm by the mean of High-Gain Harmonic Generation process [1]. The prove-of-principle of this method has been carried out in longer wavelengths at 5 μm [2]. The commissioning of the SDL accelerator was completed last year and currently it is able to produce 200 MeV, 400 A, 4 mm-mrad electron beam. The commissioning of FEL is planned to perform in several steps, starting from the generation of SASE at 400 nm. The next step will be the implementation of the seeding scheme for the lasing at 266 nm, aiming to use the third harmonic (89 nm) for chemistry applications [3]. Here we report the observation and measurements of SASE at 400 and 266 nm.

[1]. L.H.-Yu, et al., Phys. Rev. A, 44, 5178 (1991),

[2] A. Doyuran, et al., Phys. Rev. A, 26, 5902 (2001),

[3] "'Heavy Electron" Photoelectron Spectroscopy: Rotationally Resolved Ion Pair Imaging of CH_3^+ ", Science, Volume 294, Number 5551, Issue of 21 Dec 2001, pp. 2527-2529.